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Hyperpigmentation and vesicles after beach vacation

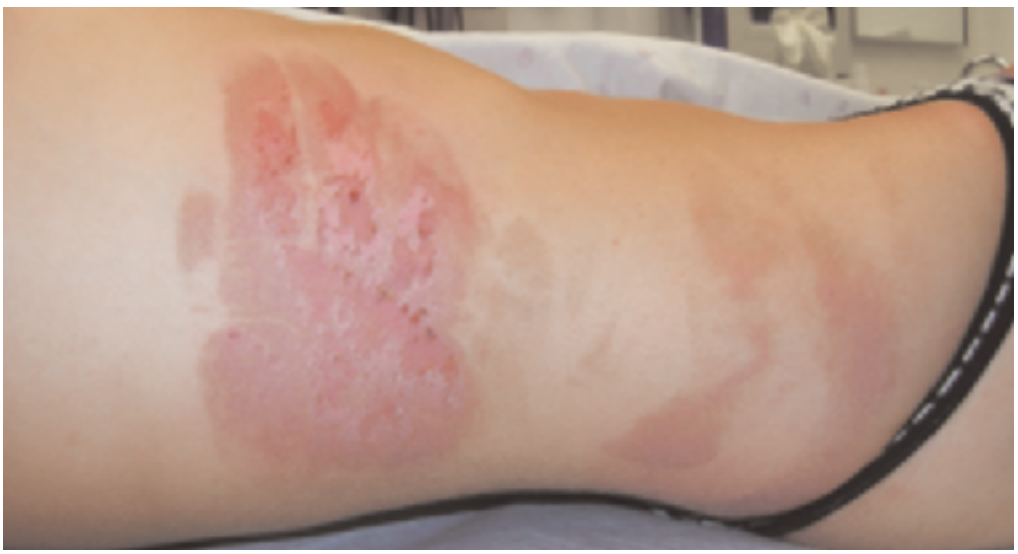
A 21-year-old woman traveled to Florida for spring break, accompanied by her fiancé and friends. While there, she developed a raised, pruritic 10-cm × 30-cm lesion on her right lateral chest wall. A local pharmacist thought she was having an allergic reaction and recommended topical hydrocortisone cream and oral diphenhydramine (Benadryl). In spite of this therapy the rash progressed.

Five days after returning home, she presented to the emergency department, where she was diagnosed with herpes zoster. The rash was described as multiple vesicles in a dermatomal distribution on the right side of her torso. She was started on famciclovir (Famvir) and given a prescription for hydrocodone with acetaminophen (Vicodin).

Four days later she presented to her primary care physician because she continued to develop areas of hyperpigmentation around her mouth, on the chin, upper chest and breasts, thighs, and forearms. The original lesion on the right lateral thorax had dried, crusted, and was beginning to peel. It was no longer pruritic. The rash had never been painful and she had not taken any hydrocodone. She was most

FIGURE 1

Vesicles on the trunk...



Right side of the patient's body, showing areas of hyperpigmentation and desquamation. Note that one area is in the shape of a hand.

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concerned about the disfigurement caused by the rash and wondered if she was having a reaction to the famciclovir. She had suffered no injuries or trauma, and did not engage in substance abuse.

While in Florida she did sun on the beach with friends, but she used sunblock regularly. She had used the same skin products and sunblock for many years. Upon questioning, she recalled drinking citrus beverages while out in the sun. Her history was otherwise unremarkable. Her only prescription medication before onset of the rash was montelukast (Singulair) prescribed for allergic rhinitis.

Examination revealed a bizarre pattern of hyperpigmentation with small punctate lesions on the upper chest, linear lesions on the posterior right arm and thighs, and broad areas of darkened skin on the lower face and chin (**FIGURE 1**). There was a broad patch of dense hyperpigmentation with desquamation on that right lateral chest wall that appeared to be healing (**FIGURE 2**).

What is your diagnosis?

FIGURE 2

...and anterior chest

The rash on the anterior chest. Note sparing of bathing suit strap areas not exposed to sun.

FAST TRACK

The severity of the reaction is worsened by high humidity, UVA intensity, and the concentration of furocoumarins in the plant juice

Diagnosis: Phytophotodermatitis

This patient has phytophotodermatitis, a phototoxic dermatologic reaction that occurs with exposure to ultraviolet light after contact with certain plants. Hyperpigmentation and vesicle or bullae formation are hallmarks of the process.

The sun-sensitizing chemicals are furocoumarins, found in many plants (**TABLE**).[1] Psoralen, the same substance used in PUVA treatments, is one of the furocoumarins. These agents contact the skin when juice is released from the fruit or stem or by direct contact with leaves.[2]

This patient remembered eating fresh limes on the beach and posing for a photograph next to her fiancé, when he placed his right hand around her back and on her right thorax (**FIGURE 1**). Limes have a high concentration of psoralens and are often the culprit in phytophotodermatitis.[1,3] It is therefore incumbent on the clinician to know this and ask about lime and plant exposure when suspecting this diagnosis.

Erythema typically develops within 24 hours of sun exposure and contact with furocoumarin-containing plants. Vesicles or bulla may develop within 72 hours. Hyperpigmentation occurs over 1 to 2 weeks and can persist for 6 to 12 months. Hyperpigmentation can appear in bizarre streaks or patterns depending on where the chemicals contacted sun-exposed skin. Areas that have formed bulla typically exfoliate within 10 to 14 days.[3]

Differential diagnosis

The differential diagnosis for this process includes herpes zoster, atopic dermatitis, allergic contact dermatitis, porphyria cutanea tarda, chemical or thermal burn, and abuse.[2,4] While chemical or thermal burn and abuse are suspected with the appropriate history, the remainder of the diagnoses have defining characteristics allowing for proper identification.

Herpes zoster is caused by the reactivation of latent varicella zoster virus. Itching or burning precedes cutaneous eruption of red swollen plaques with vesicles of various sizes, which umbilicate or rupture. These lesions occur in a discreet dermatomal distribution.[5]

Atopic dermatitis has poorly understood pathophysiology. It typically starts in infancy and causes pruritus, eczematous lesions, xerosis, and lichenification of the skin.[5]

Allergic contact dermatitis is a delayed hypersensitivity reaction that requires prior sensitization. It is classically described as pruritic papules on an erythematous base.[5]

Porphyria cutanea tarda is a caused by an inborn enzyme deficiency in the heme biosynthetic pathway that results in mechanical fragility, subepidermal bullae, hypertrichosis, and pigmentation.[5]

Pathophysiology of phytophotodermatitis

In the presence of ultraviolet A (UVA) irradiation, psoralens cause DNA cross-linkage in the skin. This stimulates increased melanin production with resultant hyperpigmentation. It may also cause the development of radicals, which damage cell membranes and intracellular contents, resulting in edema, erythema, and the formation of vesicles or bullae.[3]

Several factors have been implicated in the severity of the phototoxic reaction. Increased humidity, concentration of furocoumarins in plant juice, and UVA intensity all worsened the severity of reactions in one study. The concentration of furocoumarin is variable between species and between different parts of the same plant.[2]

Diagnosis and treatment

Consider phytophotodermatitis when patients present with hyperpigmentation, often in bizarre streaks on sun-exposed areas, or with vesicles in a nondermatomal distribution. It is a clinical diagnosis based on history and physical examination. Clues in this patient included recent vacation to Florida and consumption of citrus

TABLE

Common furocoumarin-containing plants[1]

Bitter orange	Lime
Carrot	Parsley
Celery	Parsnip
Fig	

beverages along with the bizarre pattern of rash and sparing of the skin of the upper chest covered by her bathing suit. Any laboratory data obtained are used to exclude other diseases in the differential diagnosis. For example, porphyrin levels may be obtained to rule out porphyria cutanea tarda. If the clinical diagnosis remains in question, a skin biopsy may be performed to confirm the diagnosis.

Treatment involves use of topical steroids such as triamcinolone 0.1% cream applied to the skin two to three times per day, and the application of cool compresses for comfort. Advise patients to use sunscreen to prevent further hyperpigmentation. A topical bleaching agent such as hydroquinone may help reduce hyperpigmentation, although most lesions fade with time[1] (strength of recommendation: C, based on usual practice or opinion). ■

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